Carrier
HEATING & COOLING

50ET,QT Single-Package Units

Installation, Start-Up and Service Instructions

Heat Pump and Cooling Unit Chassis Only, Sizes 212-230

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SAFETY CONSIDERATIONS

Installing and servicing air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install or service air conditioning equipment.

Untrained personnel can perform basic maintenance, such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in literature and on tags and labels attached to unit.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available.

⚠ WARNING

Before installing or servicing unit, turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury.

IMPORTANT: Final wiring inspection by local authorities must be done before chassis is installed in sleeve.

⚠ WARNING

The Model 50ET,QT chassis is an uncased unit and, therefore, requires special care in handling to prevent injury to installer and damage to unit. A portable lifting device must be used to move and position unit. Be careful of sharp edges when handling chassis.

INTRODUCTION

Install Model 50ET air conditioner or 50QT heat pump chassis in accessory wall sleeve. See Table 2 for part numbers. Wall sleeves are shipped separately with accompanying installation instructions. All electrical power, ductwork and condensate drain hookups are made at time of wall sleeve installation.

IMPORTANT: Carrier standard outdoor grille *or* deluxe outdoor grille must be ordered separately and installed in wall sleeve before chassis is installed. *Do not run unit without proper outdoor grille in place.* See Table 2 for part numbers.

INSTALLATION

Step 1 — Check Equipment and Jobsite

UNPACK UNIT — Move to final location. Lift cardboard carton off chassis taking special care not to damage unit.

INSPECT EQUIPMENT for damage prior to installation. To remove metal cover plate, remove 6 screws. File claim with shipping company if shipment is damaged or incomplete.

Leave chassis bolted to skid and replace metal cover plate and carton until ready for installation into wall sleeve.

INSPECT WALL SLEEVE installation for damage. Condensate drain pan must be free of debris and installed in accordance with local building regulations. Electrical connector on left side of sleeve should be free of dirt, grease, paint, etc. Connector must be properly wired before chassis installation. Duct connection panel must be level and duct connections complete. Do not rest weight of ductwork on duct connector panel. Inspect nameplate on sleeve to ensure wire and fuse sizing is correct for model size and heater accessory to be installed.

NOTE: If remote thermostat location is desired, location must be determined and field wiring must be installed before wall completion.

→INSPECT OUTDOOR FAN for proper clearance. Remove outdoor fan grille by removing 3 screws. Discard metal shipping support held in place by lower screw. Spin fan by hand. If any interference is noted between the fan blades and orifice, adjust the orifice manually to provide adequate clearance. Check fan position on shaft as shown in Fig. 19. Replace fan grille.

Remove styrofoam shipping block from underneath compressor mounting pan (Models 50ET,QT212 and 215 only).

Step 2 — Install Chassis in Wall Sleeve — Remove sleeve filler panel and save screws.

INSTALL ACCESSORY OUTDOOR GRILLE — Install outdoor grille using screws saved. Refer to instructions shipped with outdoor grille.

Table 1 — Electrical Data (60 Hz)

MODEL 50ET/QT	V/PH	OPER VOLTS*		COMPR		IFM	OFM	ELECTRIC HEATER		FIELD WIRE SIZE FOR INCOMING POWER TO CKT BKR BOX	BRANCH CIRCUIT #1‡ (or Total Unit)			BRANCH CIRCUIT #2‡ (When Used)		
		Max	Min†	LRA	RLA	FLA	FLA	kW	Amps		Max TD Fuse** or HACR Ckt Bkr Amps	MCA	Field Wire Size from Ckt Bkr to Unit	Max TD Fuse** or HACR Ckt Bkr Amps	MCA	Field Wire Size from Ckt Bkr to Unit
212300	208/230/1	254	187	37	6.8	1.5	1.0	None	—	—	15/15	11.0/11.0	—	—	—	—
								3.0	9.4/12.5		25/30	22.8/26.6		—	—	
								5.0	18.0/20.8		35/40	33.5/37.0		—	—	
215300	208/230/1	254	187	43	8.7	1.5	1.0	None	—		20/20	13.4/13.4		—	—	
								3.0	9.4/12.5		25/30	25.1/29.0		—	—	
								5.0	18.0/20.8		35/40	35.9/39.4		—	—	
218300	208/230/1	254	187	50	10.1	1.7	1.5	None	—	—	20/20	15.8/15.8	—	—	—	—
								3.0	9.4/12.5		30/35	26.6/30.5		—	—	
								5.0	18.0/20.8		40/45	37.3/40.8		—	—	
								7.5	26.8/31.3		50/60	48.3/54.0		—	—	
224300††	208/230/1	254	187	59	13.0	2.0	1.5	None	—		15/15	2.5/ 2.5		25/25	17.9/17.9	
								5.0	17.3/20.8		25/30	24.1/28.5		25/25	17.9/17.9	
								7.5	26.8/31.3		35/40	36.0/41.6		25/25	17.9/17.9	
								10.0‡‡	36.1/41.7	**4/3**	50/60	47.6/54.6	**6/6**	25/25	17.9/17.9	**12/12**
230300††	208/230/1	254	187	79	16.9	2.4	1.5	None	—	—	15/15	3.0/ 3.0	—	35/35	25/25	—
								5.0	17.4/20.8	—	30/30	24.8/29.0	—	35/35	25/25	—
								7.5‡‡	26.8/31.3	**4/4**	40/40	36.5/42.1	**8/6**	35/35	25/25	**10/10**
								10.0‡‡	36.0/41.7	**3/3**	50/60	48.0/55.1	**6/6**	35/35	25/25	**10/10**

FLA — Full Load Amps
HACR — Heating, Air Conditioning, Refrigeration
IFM — Indoor Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
OFM — Outdoor Fan Motor
RLA — Rated Load Amps
TD — Time Delay

*Permissible limits of the voltage range at which units will operate satisfactorily.
†Minimum voltage is 197 when outdoor ambient temperature exceeds 105 F.

‡Field wiring to be sized per NEC or local codes. Use copper wire only.
**Maximum dual element fuse size.
††These units require 2 separate supply circuits. Refer to both branch circuit charts for complete electrical data. Two-circuit fused disconnect must be field supplied except for heaters denoted by ‡‡.
‡‡Supplied with circuit breakers and box which must be used for unit power supply.

NOTE: Dual values in this table (for example: Electric Heater Amps: 9.4/12.5) apply to 208- and 230-volt connections, respectively.
Wire sizes in **boldface** type pertain to conductor temperature rating of 60 C.

Table 2 — Accessories

PART NO.	DESCRIPTION	MODEL 50ET,QT
50QT902061	Wall Sleeve (one)	212, 215, 218
50QT900081	Wall Sleeve (one)	224, 230
50QT90301106	Standard Aluminum Grille (six)	All
50QT90302106	Architectural Grille (six)	All
50QT90400102	Polymer Front Cover (two)	212, 215, 218
50QT90401102		224, 230
50QT90700106	Fresh Air Damper (six)	All
50QT905001	Cold Climate Package (one)	All
COOLING THERMOSTATS: One-Stage Heat, One-Stage Cool		
99TZ900321/ 99TZ900361*	Automatic Changeover	All
99TZ900321/ 99TZ900391*	Manual Changeover	All
HEAT PUMP THERMOSTATS: Two-Stage Heat, One-Stage Cool		
99TZ900291*	Manual Changeover	All
99TZ900401*	Automatic Changeover	
99TZ900511*	Manual Changeover	
99TZ900501*	Electronic, 7-Day Programmable	
99TZ900541†	Manual Changeover	
ELECTRIC HEATERS (kW)		
50QT901001	3	212, 215, 218
50QT901011	5	212, 215, 218
50QT901021	7.5	218
50QT901031	5	224
50QT901041	7.5	224
50QT901051	10	224
50QT901061	5	230
50QT901071	7.5	230
50QT901081	10	230

*For remote mounting only.
†Suitable for mounting on unit chassis.

INSTALL ACCESSORY COLD CLIMATE PACKAGE IF REQUIRED — Cold climate accessory should be installed where the outdoor ambient temperature consistently falls below 30 F. Refer to Table 2 for correct accessory part number. Refer to instructions packaged with accessory for installation.

IMPORTANT: Be sure disconnect, per NEC, installed with the wall sleeve is in OFF position before proceeding with chassis installation.

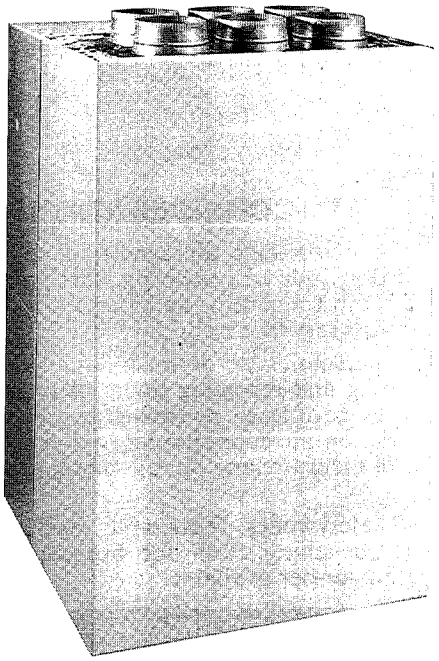
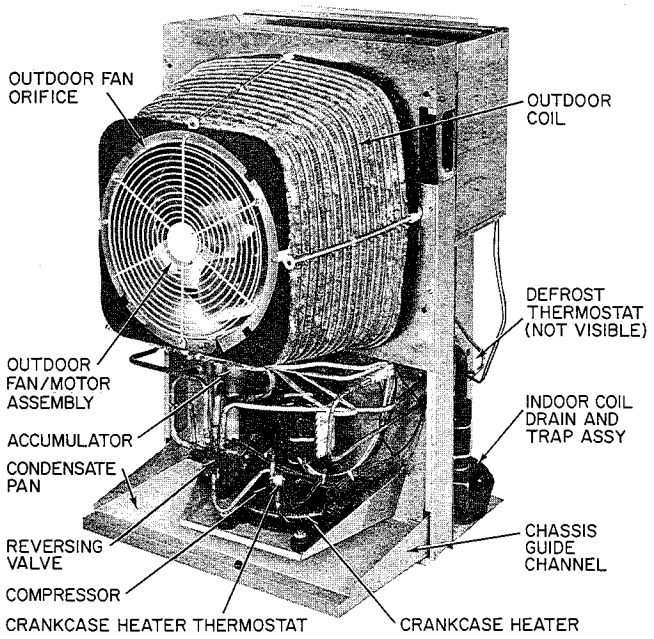


Fig. 1 — Chassis with Accessory Indoor Polymer Wrapper

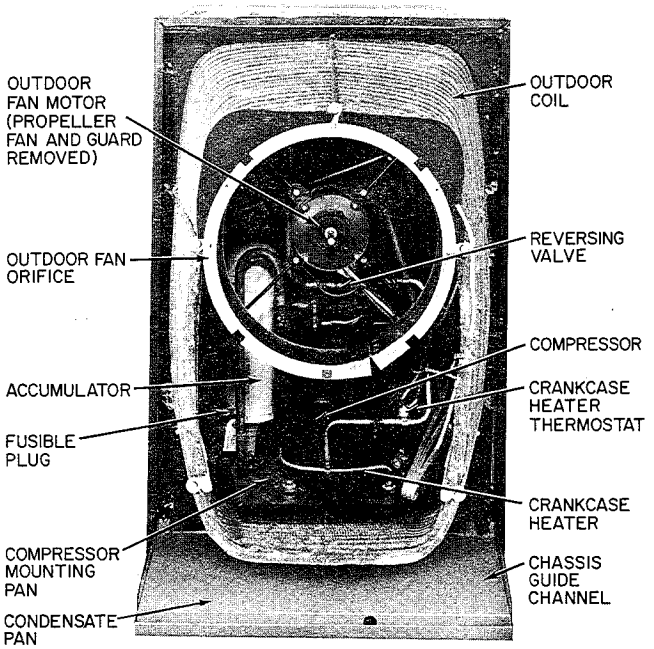
SLIDE CHASSIS INTO SLEEVE — Chassis is heavy. Portable lifting device must be used. Exercise caution to be sure forks do not damage chassis components (such as drain connections) while lifting and installing. Guide chassis into sleeve on indoor side by first placing chassis guide channels onto lower corners of sleeve. Slide chassis into sleeve until center partition perimeter meets gasket provided around outer edge of sleeve. Check electrical plugs for alignment as chassis is slid into place.

⚠ WARNING

Do not release chassis until installed and bolted completely into sleeve as it may fall out without warning.



50QT212,215 (shown)



50QT218,224 (shown), 230

Fig. 2 — Outdoor Component Location

Tighten chassis into place by driving 6 lag bolts, provided in separate bag with chassis into nuts provided on sleeve (see Fig. 3).

Electrical and condensate drain connections are complete when chassis is installed correctly into sleeve.

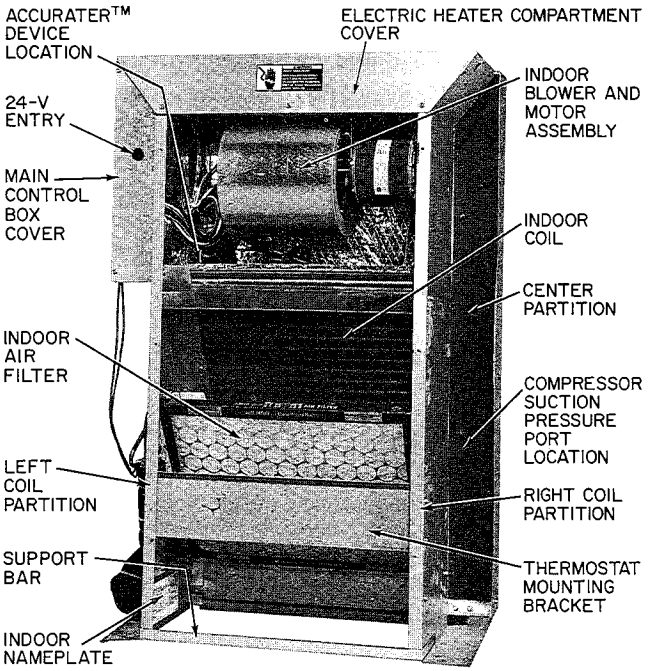
⚠ CAUTION

Tighten lag bolts uniformly. Failure to do so may cause misalignment and poor electrical connection.

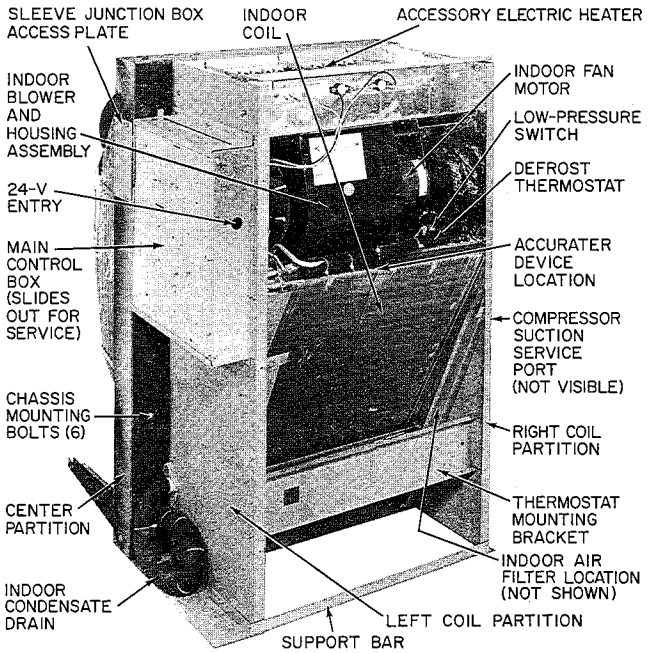
Step 3 — Install Accessory Thermostat and Connect Thermostat Wiring — Accessory thermostat can be installed on the 50ET,QT chassis or in a remote location.

TO MOUNT THERMOSTAT IN UNIT:

1. Remove metal cover plate by removing 6 screws.
2. Locate and install subbase onto thermostat bracket running between right and left coil partition (see Fig. 3). Push field-supplied thermostat wires through hole provided.
3. Route thermostat wires through hole located on left coil partition and up to low-voltage wire entrance hole on control box front cover.
4. Remove 2 screws and slide control box to expose low-voltage terminals. Attach wires to appropriate terminals as shown on unit wiring diagram. See Fig. 4.
5. Attach thermostat to subbase and snap on thermostat cover.

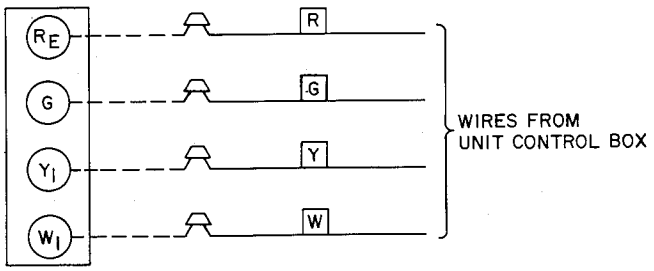


50QT212,215,218



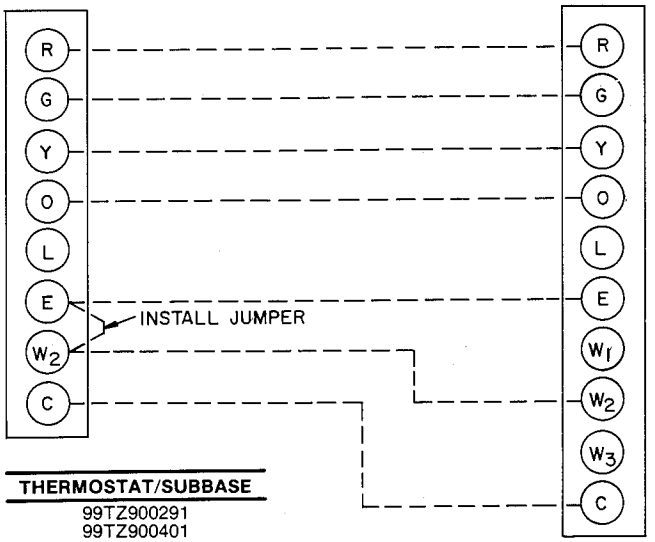
50QT224,230

Fig. 3 — Indoor Component Location



THERMOSTAT	SUBBASE
99TZ900321	99TZ900361
99TZ900321	99TZ900391

COOLING UNIT WITH ELECTRIC HEAT



THERMOSTAT/SUBBASE
99TZ900291
99TZ900401
99TZ900511
99TZ900541

HEAT PUMP WITH SUPPLEMENTAL ELECTRIC HEAT

Fig. 4 — Thermostat Connection Diagrams — 50ET,QT

6. Cut and remove insulation from hole in metal cover plate.
7. Replace metal cover plate.
8. Install accessory polymer front cover as described in instructions shipped with accessory cover. Cut rectangular hole for thermostat as indicated by mark in back of cover.

TO MOUNT THERMOSTAT REMOTELY:

1. Pull field-supplied thermostat wires previously installed up into wire entrance hole on control box front cover and connect wires as described in Step 3, paragraph 4, on page 3.
2. Connect other ends of thermostat wires, hanging from the wall at their remote location, securely into subbase at appropriate terminals specified in unit wiring diagram. See Fig. 4.
3. Mount subbase onto wall.
4. Attach thermostat to subbase. Snap on cover and install chassis indoor cover.

Step 4 — Set Indoor Fan Motor Speed — All units are factory wired for low fan speed. Higher external static pressure requirements can be met by wiring motor for higher fan speed. See Table 3.

Table 3 — Service Data

SIZE	212		215		218		224		230	
MODEL 50	ET	QT	ET	QT	ET	QT	ET	QT	ET	QT
R-22 CHARGE* (lb)	2.3	2.7	2.3	2.7	3.1	3.75	4.0	4.5	3.9	4.7
Refrig Control	AccuRater™ Bypass Type									
INDOOR FAN	Centrifugal Blower, Direct Drive, 2-Speed									
Rotation†	CW		CW		CW		CCW		CCW	
Rpm	1580		1550		1570		1675		1675	
Diameter (in.)	6		6		6		7		7	
Width (in.)					8					
Range (cfm)	430/375		550/475		575/480		885/800		1025/960	
Motor Hp	1/5		1/5		1/5		1/4		1/4	
OUTDOOR FAN	Propeller, Direct Drive, Single Speed									
Cfm	1700		1700		2000		2000		2000	
Rpm					1125					
Diameter (in.)					15					
Motor Hp					1/6					

CCW — Counterclockwise
CW — Clockwise

*Factory refrigerant charge.
†Looking at fan motor shaft.

Step 5 — Install Accessory Electric Heater, If Required — Refer to instructions packaged with accessory heater. See Table 2 for part numbers.

START-UP

Crankcase Heater — The 50QT compressor is equipped with a crankcase heater that is thermostatically activated in cold weather. (See Fig. 2 and 3.) If temperature is below 65 F, operate crankcase heater 24 hours before starting unit. To energize crankcase heater only, after chassis installation, set thermostat to ⟷ position (for thermostat mounted on the chassis) or OFF position (for remote-mounted thermostat) and turn on unit power at disconnect switch.

To Start Unit — Check that main power is on and, if temperature is below 65 F, that compressor crankcase heater has been energized for at least 24 hours.

1. Set selector switch at ⟷ if thermostat is mounted on chassis, or at OFF if thermostat accessory is remote mounted.
2. Set fan switch as desired (FAN) (AUTO.).
3. Set thermostat lever at the desired temperature.
4. Set selector switch at HEAT or COOL. Check system refrigerant charge. See Refrigerant Charging.

SERVICE

Service Port Connections — High and low side pressure connections are accessible from the indoor portion of the unit for charging. (See Fig. 3.)

Low-Pressure Switch (50QT only) (Safety Control) is located on liquid line downstream of AccuRater™ control during cooling mode (or upstream of AccuRater control during heating mode). Switch opens at 5 psig and shuts down compressor to protect it from overheating if refrigerant charge is too low.

High-Pressure Relief Valve (Safety Control) is located in compressor. Relief valve opens at a pressure differential of approximately 450 ± 50 psi between suction (low side) and discharge (high side) to allow pressure equalization.

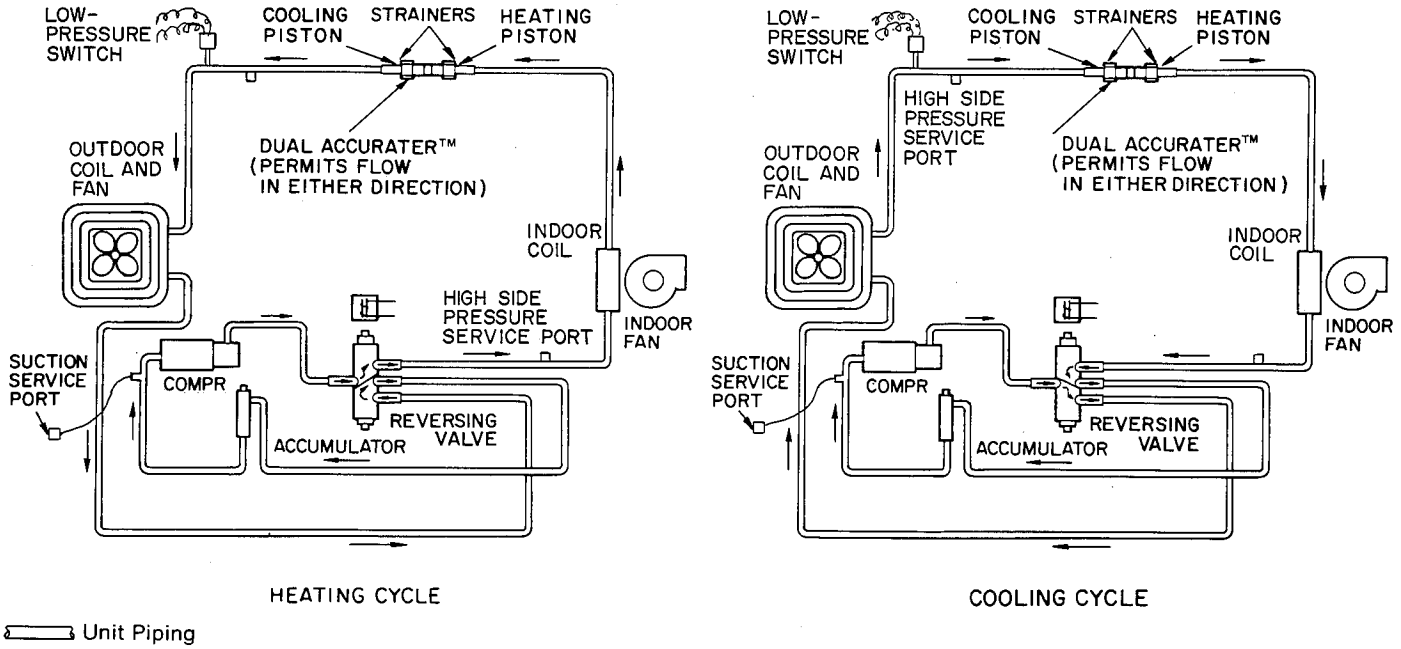


Fig. 5 — 50QT Refrigerant Flow Diagrams

Internal Current and Temperature Sensitive Overload (Safety Control) resets automatically when compressor motor temperature drops to a safe level (overloads may require up to one hour to reset). When an internal overload is suspected of being open, check by using an ohmmeter or continuity tester. If necessary, refer to Carrier Standard Service Techniques Manual, Chapter 2, Electrical, for complete instructions.

Defrost Control consisting of a control board and defrost thermostat, interrupts normal system heating operation to remove frost and ice formation on outdoor coil. Frost impairs unit performance. Defrost control simultaneously stops outdoor fan, energizes reversing valve solenoid to switch system into cooling cycle (outdoor unit as condenser, indoor unit as evaporator), and activates accessory electric heater. Unit can defrost every 90 minutes, but will do so only if outdoor temperatures are in the frosting temperature zone.

For heat pump to defrost, 2 conditions are necessary:

1. Defrost circuit board contacts must be closed.
2. Coil temperature must be cold enough to cause defrost thermostat contacts to close.

Contacts close at 27 ± 5 F. Every 90 minutes of elapsed running time, the defrost circuit board contacts close for 10 seconds. If the defrost thermostat contacts are closed, the unit defrosts. The defrost circuit board limits defrosting period to 10 minutes. Normally the frost is removed and the defrost thermostat contacts open to terminate defrosting before 10 minutes have elapsed. Defrost thermostat contacts open at 80 ± 5 F. When defrosting is terminated, the outdoor fan motor is energized and reversing valve solenoid is de-energized, returning unit to heating cycle.

HEAT PUMP CIRCUITS shown in Fig. 5 are refrigerant flow diagrams for heating and cooling cycles.

Refrigerant Charging

⚠ CAUTION

To prevent personal injury, wear safety glasses and gloves when handling refrigerant.

Do not overcharge system. An overcharge can cause compressor damage.

Unit refrigerant system is factory charged. When recharging is necessary, weigh in total charge indicated in Table 3. (Charge must be weighed in during heating season.) Remove any refrigerant remaining in system before recharging. If system has lost complete charge, triple-evacuate system to 5000 microns (29.7 in. vacuum) before recharging. Service port connections are provided on unit suction and discharge lines for evacuation and charging. (See Fig. 5 for service port location.) Dial-a-charge charging cylinder is an accurate device used to recharge systems by weight. These cylinders are available at refrigeration supply firms.

To check and/or adjust charge during cooling season, use Cooling Cycle Charging Charts (Fig. 6, 8, 10, 12, 14) and follow Charging Chart Method on page 6. The charging chart may also be used as an alternate method of recharging system.

To check *system operation* during heating cycle, use Heating Cycle Operation Check Chart (Fig. 7, 9, 11, 13, 15). These charts indicate whether a correct relationship exists between system operating pressures and air temperatures entering unit. If pressure and temperature lines do not intersect on chart, the system refrigerant charge may not be correct or other system abnormalities may exist. Do not use Operating Check Charts to adjust refrigerant charge. Weigh charge into system.

COOLING CYCLE CHARGING CHART METHOD

1. Operate unit a minimum of 10 minutes before checking charge, and after each charge adjustment.
2. Measure suction pressure by attaching a gage to unit suction service port. (See Fig. 5 for correct service port location.)
3. Measure outdoor (coil inlet) air dry-bulb temperature. Use service thermometer.
4. Using a sling psychrometer, measure wet-bulb temperature of air entering indoor fan coil.
5. Refer to Charging Chart. Locate on curves where outdoor air dry-bulb and indoor air wet-bulb temperature lines intersect.
6. From intersect point, project vertically downward to chart suction pressure line. Compare chart suction pressure to unit suction pressure (step 2).
7. If unit suction pressure is lower than chart pressure, add refrigerant to system until chart pressure is reached. If unit suction pressure is higher than chart pressure, remove refrigerant until chart pressure is reached.

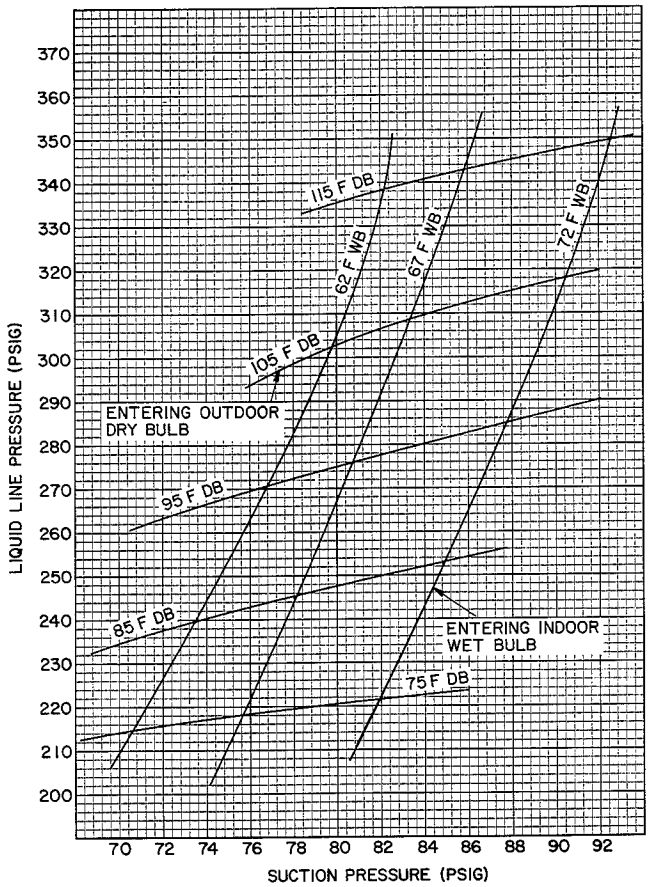


Fig. 6 — 50ET,QT212 Cooling Cycle Charging Chart

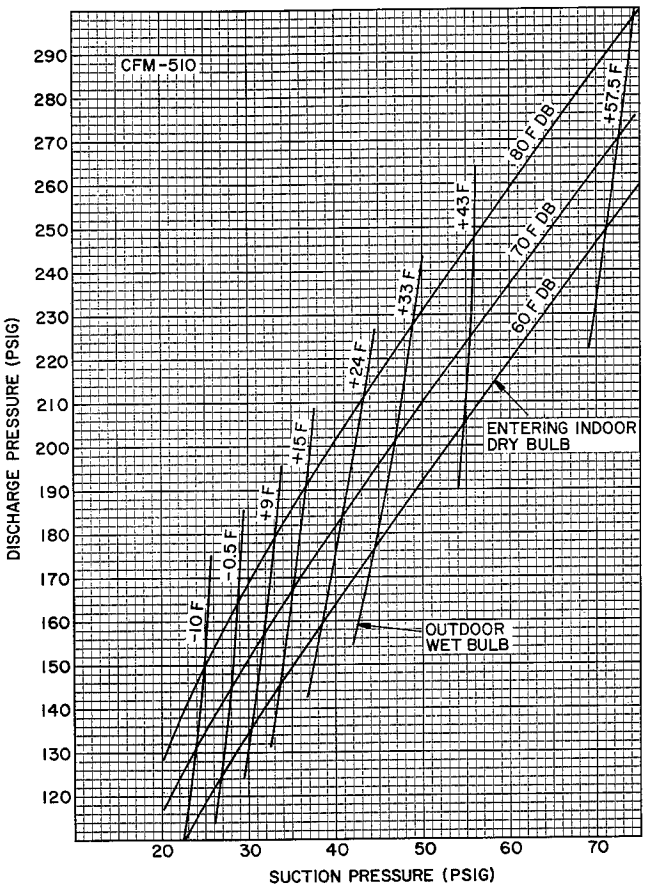


Fig. 7 — 50QT212 Heating Operation Check Chart

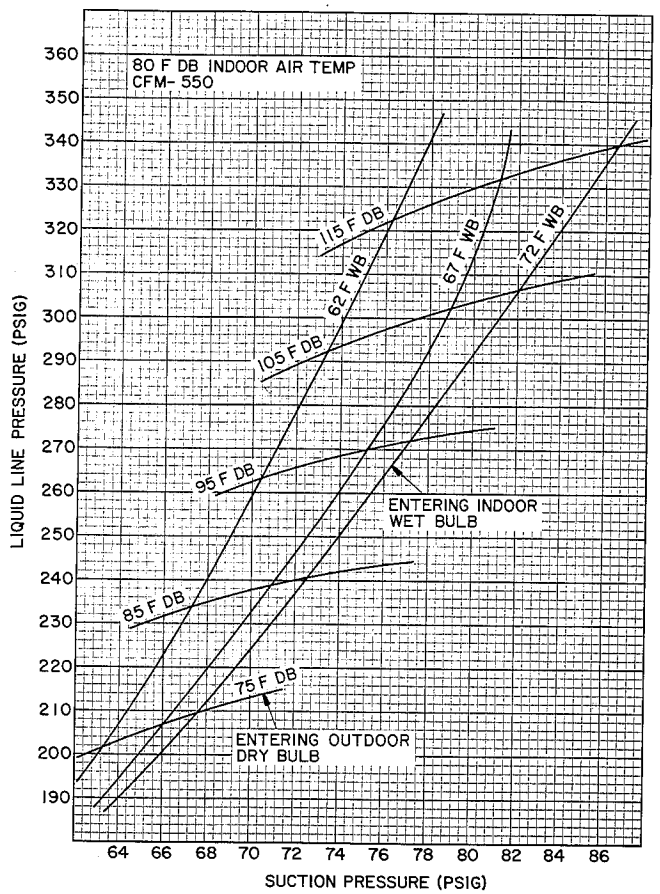


Fig. 8 — 50ET,QT215 Cooling Cycle Charging Chart

NOT AVAILABLE AT TIME OF PRINTING

Fig. 10 — 50ET,QT218 Cooling Cycle Charging Chart

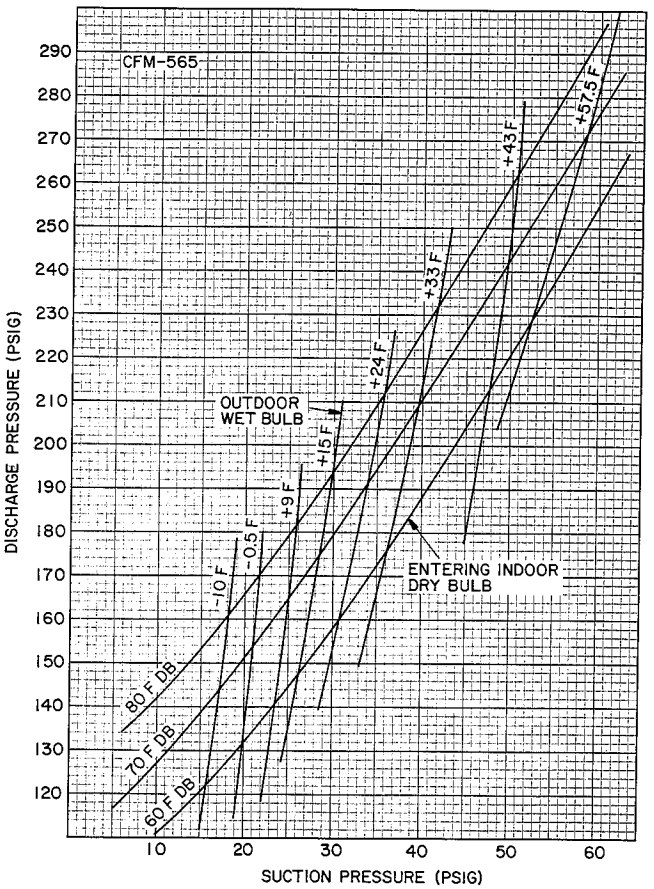


Fig. 9 — 50QT215 Heating Operation Check Chart

NOT AVAILABLE AT TIME OF PRINTING

Fig. 11 — 50QT218 Heating Operation Check Chart

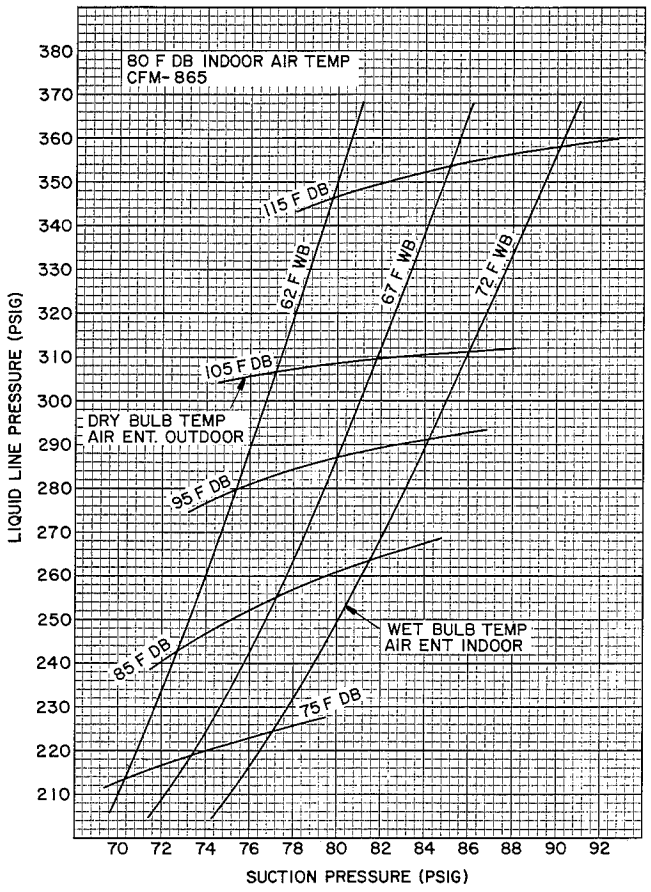


Fig. 12 — 50ET,QT224 Cooling Cycle Charging Chart

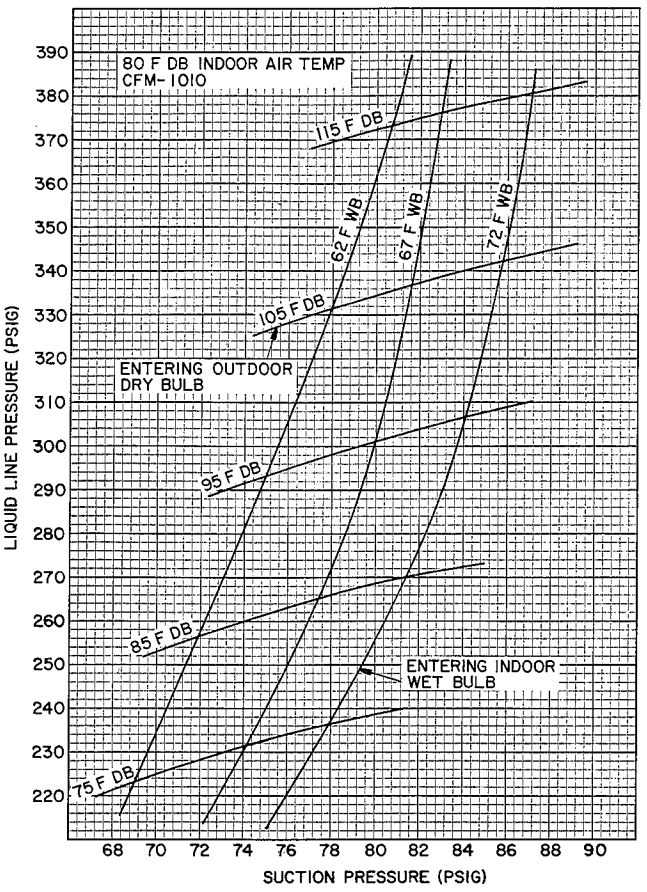


Fig. 14 — 50ET,QT230 Cooling Cycle Charging Chart

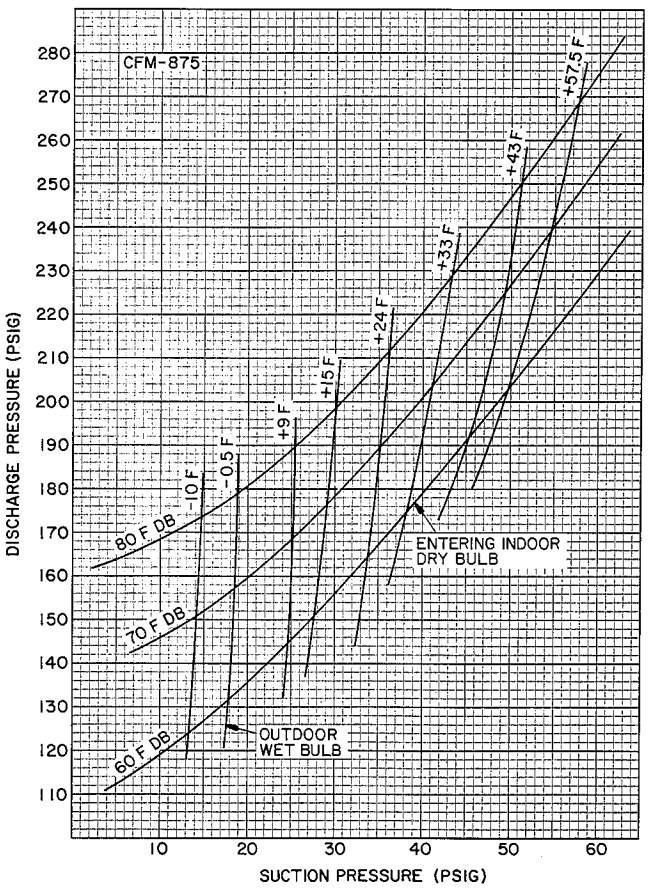


Fig. 13 — 50QT224 Heating Operation Check Chart

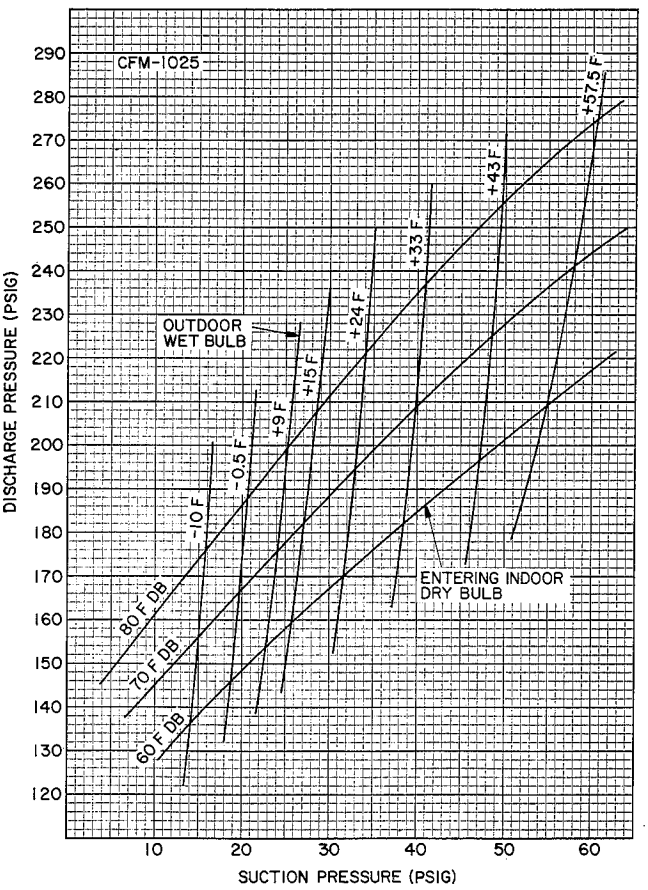


Fig. 15 — 50QT230 Heating Operation Check Chart

AccuRater™ Device (Dual-Piston Type) Servicing — See Fig. 16 for AccuRater components. The pistons have a refrigerant metering orifice through them. The retainers form a stop for the pistons in the refrigerant bypass mode, and a sealing surface for liquid line flare connection. To clean or replace piston:

1. Shut off power to unit.
2. Protect area around unit to prevent damage to interior, furnishings, etc.
3. Remove refrigerant from unit.
4. Remove liquid line flare connections from AccuRater. See Fig. 3 for AccuRater location.
5. Note position of arrow on AccuRater body in relation to unit.
6. Pull retainer out of body. Be careful not to scratch flare sealing surface. If retainer does not pull out easily, carefully use locking pliers to remove retainer. Replace scratched or damaged retainer.
7. Slide piston out by inserting a small soft wire through metering hole (18-gage thermostat wire). Check that metering hole, sealing surface around piston cones and fluted portion of piston are not damaged.
8. See chart on indoor blower scroll for illustration of proper arrangement and sizes of pistons.
9. Clean piston refrigerant metering orifice.
10. Replace retainer O-ring before reassembling AccuRater. Carrier O-ring Part No. is 99CC501052.

LIQUID LINE STRAINERS (protect AccuRater) are made of wire mesh and located in the liquid line on each side of the AccuRater. The strainers are pressed into the line. Remove strainer by threading a #10 sheet metal screw into strainer and pulling the screw with pliers.

Compressor Removal — (Refer to Fig. 2.)

IMPORTANT: Compressor cannot be removed from an installed chassis. Remove chassis from sleeve, then bring to service truck or dealer shop before removing compressor.

See Table 4 for compressor information. Follow safety codes and wear safety glasses and work gloves. Have quenching cloth available.

⚠ CAUTION

Aluminum tubing is used in 50QT coils. Do not overheat or place excessive strain on tubing or damage may result.

Table 4 — Compressor Data

MODEL 50ET,QT	COMPRESSOR	OIL RECHARGE (oz)
212	Copeland RE-Z3-0150-PFV	20
215	Tecumseh AB5515H	32
218	Bristol H22B193ABCA	27
224	Copeland CRD-10200-PFV	51
→ 230	Tecumseh AV5532H	52

Compressor Removal — 50ET,QT212,215

1. Shut off power to unit. Remove chassis indoor cover, Fig. 1.
2. Remove chassis to truck or shop.
3. Remove refrigerant from unit using refrigerant removal methods described in Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants.
4. Remove core from suction and discharge line Schrader valves.

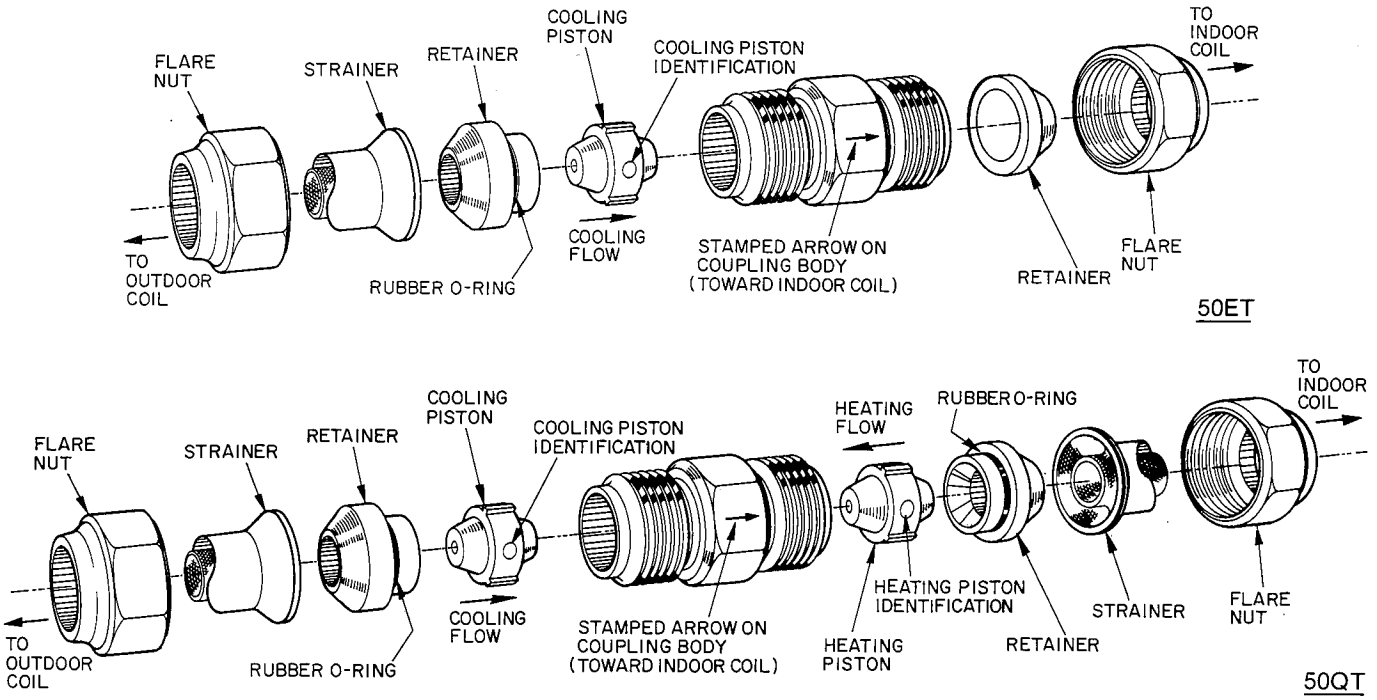


Fig. 16 — AccuRater Device (Dual-Piston) Components

5. Disconnect compressor wiring at compressor terminal box.
6. Using a tubing cutter, cut suction and discharge lines at convenient place near compressor for easy reassembly to new compressor with copper slip couplings.

⚠ CAUTION

Excessive movement of copper lines at compressor may cause a break where lines connect to other system components.

7. Remove crankcase heater from compressor base.
8. Remove clamp holding accumulator to shell.
9. Remove compressor holddown bolts and lift compressor out, sliding and tipping it towards the outside.
10. Carefully unbraze suction and discharge line piping stubs from compressor. If oil vapor in piping stubs ignites, use quenching cloth.
11. Braze piping stubs (removed in step 10) on new compressor, in same position as before.
12. Install new compressor in unit. Braze suction and discharge lines to compressor piping using field-supplied copper couplings. Ensure compressor holddown bolts are in place. Reinstall crankcase heater. Connect wiring.
13. Triple-evacuate to 5000 microns and recharge unit. See Refrigerant Charging section.
14. Refer to NOTE at the end of this section for important information.

Compressor Removal — 50ET,QT218, 224, 230

1. Shut off power to unit. Remove chassis indoor cover, Fig. 1.
2. Remove chassis to truck or shop.
3. Remove refrigerant from unit using refrigerant removal methods described in Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants.
4. Remove core from suction and discharge line Schrader valves.
5. Remove outdoor fan guard.
6. Remove outdoor compressor guard.
7. Remove outdoor propeller fan.
8. Remove outdoor fan orifice ring by removing 4 screws attaching it to outdoor fan motor bracket.
9. Remove 3 of 4 outdoor fan motor bolts, leaving bolt at upper right of fan motor in place. Rotate motor up and out of the way by hinging it on remaining bolt. Use wire or solder to tie outdoor fan motor to outdoor coil support on top side of coil.
10. Using a miniature tubing cutter, cut compressor suction tube on short vertical run as tube enters compressor.
11. Cut compressor discharge tube on horizontal tubing run approximately 6 to 12 in. from where it leaves the compressor. Keep crankcase heater thermostat on right side of cut so it stays in place when compressor is removed.
12. Disconnect compressor wiring at compressor terminal box. Remove compressor wires and crankcase heater splice from box.
13. Using an 18-in. long extension on ratchet wrench, remove 4 compressor holddown bolts.
14. Slide compressor out to edge of pan. Remove crankcase heater by loosening worm drive clamp and sliding over top of compressor.
15. Remove compressor from pan.
16. Carefully unbraze suction and discharge line piping stubs from compressor. If oil vapor in piping stubs ignites, use quenching cloth.
17. Braze piping stubs (removed in step 16) on new compressor, in same direction as before.
18. Using field-supplied copper couplings, install new compressor in unit.
19. Reassembly is reverse of above procedure.
20. Triple-evacuate to 5000 microns and recharge unit. See Refrigerant Charging section.

NOTE: If a compressor failure was caused by motor winding burnout, the by-products of the burnout must be separated from the circulating refrigerant. This must be done before the by-products enter the reversing valve or accumulator and render parts inoperative. Burnout by-products can cause future system operating problems if left in the system.

Clean the system by installing a suction line drier in the refrigerant line where the suction gas enters the reversing valve. During the cooling cycle, this is the line from the indoor coil running to the compressor compartment; during heating cycle, install drier in line between outdoor coil and reversing valve. If possible, run unit in cooling mode when cleaning system as no defrosting occurs.

To provide protection for the reversing valve, do not place filter drier between reversing valve and accumulator. Since the suction drier works on one mode only, temporarily wire the unit in the selected mode (heating or cooling, based on suction drier location). To insure cooling operation only, install a jumper between terminals no. 1 and no. 4 on receptacle no. 3. For heating operation only, remove and insulate one of the reversing valve solenoid leads. Run unit for 2 hours and check oil for acidity. If satisfactory, remove suction line drier. Refer to and follow procedure under AccuRater™ Servicing for cleaning of AccuRater. Rewire unit to normal condition.

Lubrication — Compressor contains factory oil charge. Replace oil when lost. See Table 4 for oil recharge. If necessary, refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants, page 1-21, for oil recharging procedure. Use Carrier PP33-1, Texaco WF-32 or Suniso 3GS oil.

FAN MOTOR BEARINGS — Oiling holes are provided at each end of outdoor fan motor. Remove fan motor and lubricate motor with 32 drops (16 drops per hole) of SAE 10 nondetergent oil at intervals described below:

a. Annually when environment is very dirty, ambient temperature is higher than 105 F and average unit operating time exceeds 15 hours a day.
b. Every 3 years when environment is reasonably clean, ambient temperature is less than 105 F and unit operating time averages 8 to 15 hours a day.
c. Every 5 years when environment is clean, ambient temperature is less than 105 F and unit operating time averages less than 8 hours a day.

INDOOR MOTOR — To oil indoor motor, remove dust caps or plugs from oil holes located at each end of the motor. Use a teaspoon, 5 cc (5 ml), 3/16 oz or 16 to 25 drops of a good grade of SAE 20 nondetergent motor oil in each oil hole. Allow time for total quantity of oil to be absorbed into each bearing. After oiling motor, be sure to wipe off excess oil from housing and replace cap or plugs on oil port.

Outdoor Coil Cleaning — To be done at the beginning of each cooling season or more often if required.

⚠ CAUTION

Fin damage or removal can result in higher operating costs or compressor damage. Do not use flame, high-pressure water, steam, or volatile or corrosive cleaners on fins and tubing. Follow these instructions carefully. Contact your dealer if you encounter problems.

1. Shut off power to unit.
2. Remove chassis from sleeve by removing 6 bolts and sliding chassis out. Transport chassis to an appropriate cleaning location.
3. Clean coil using vacuum cleaner and its crevice tool (see Fig. 17). Work crevice tool perpendicularly to coil tubes, making sure tool only touches dirt on fins. To prevent fin removal, do not "scrub" fins with tool or move tool parallel to coil tube configuration.

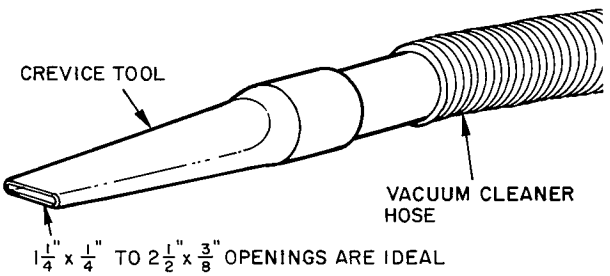


Fig. 17 — Crevice Cleaning Tool

4. If oil deposits are present, spray coil with liquid household detergent. Wait 10 minutes, then proceed to step 5.
5. Using garden hose, spray coil perpendicularly to coil tubes with a constant stream of water at moderate pressure (see Fig. 18). Keep nozzle at a 15 to 20 degree angle, about 3 in. from coil face and 18 in. from tube. Spray so debris is washed out and away from coil making sure water does not contact components on side of chassis.
6. Make sure condensate pan drain is not clogged with debris.
7. Reinstall chassis in sleeve.
8. Restore power to unit.

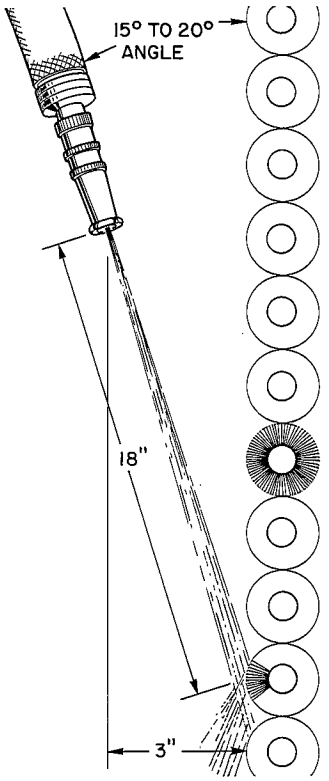


Fig. 18 — Positioning Hose to Spray Coil

Indoor Coil and Condensate Pan Cleaning — Clean and inspect indoor coil, condensate pan and drain at same time outdoor coil is cleaned.

1. Use vacuum cleaner nozzle to clean the face of coil.
2. Clean condensate pan with a brush similar to that shown.

3. Hold pail under condensate pan drain connection and flush pan by slowly pouring water on coil. Do not overflow pan.

Indoor Air Filter Replacement (Refer to Fig. 3.) — Replace filters at least 4 times per year especially at the beginning of the heating and cooling seasons.

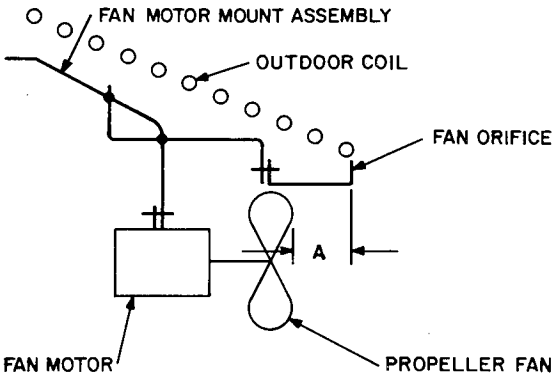
On 50ET,QT212,215 and 218, slide filter through slots at bottom of left and right coil partitions. Slide filter upward until top of filter reaches top of filter brackets. Then, rest bottom of filter on bottom flanges of left and right coil partitions.

On 50ET,QT224 and 230, slide filter upward until top of filter reaches top of filter brackets. Then, rest bottom of filter on horizontal sheet metal shelf between left and right coil partitions making sure tabs at bottom of filter brackets hold filter in place.

Outdoor Fan Adjustment — Required fan position is shown in Fig. 19. Adjust position by loosening setscrew on fan hub and moving in or out of orifice.

Outdoor Fan/Motor Removal

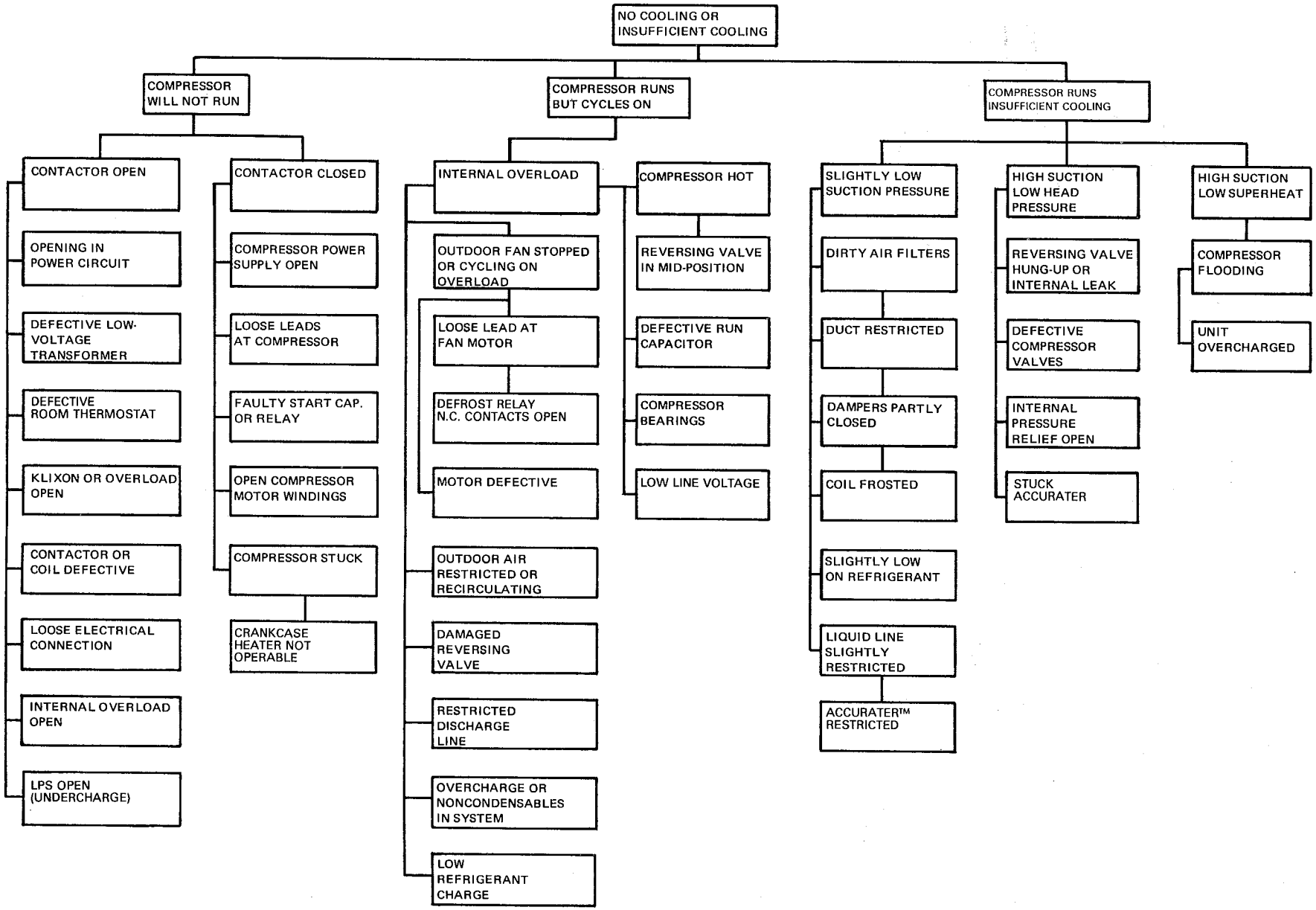
1. Shut off power to unit.
2. Remove chassis from sleeve as described previously in Outdoor Coil Cleaning section.
3. Remove 4 nuts from outer tip of coil support rods and remove wire mesh guard.
4. Remove fan blade from motor shaft by loosening hub setscrews and slipping it off shaft.
5. Remove fan motor leads from electrical components in indoor side control box and pull through bulkhead so they are loose in outdoor machine compartment.
6. Remove nuts and bolts connecting 4 motor ears to motor support struts.
7. Remove motor and leads.
8. Reassembly is reverse of above procedure. Make sure guard is replaced and fan is positioned correctly as in Fig. 2 and 19.



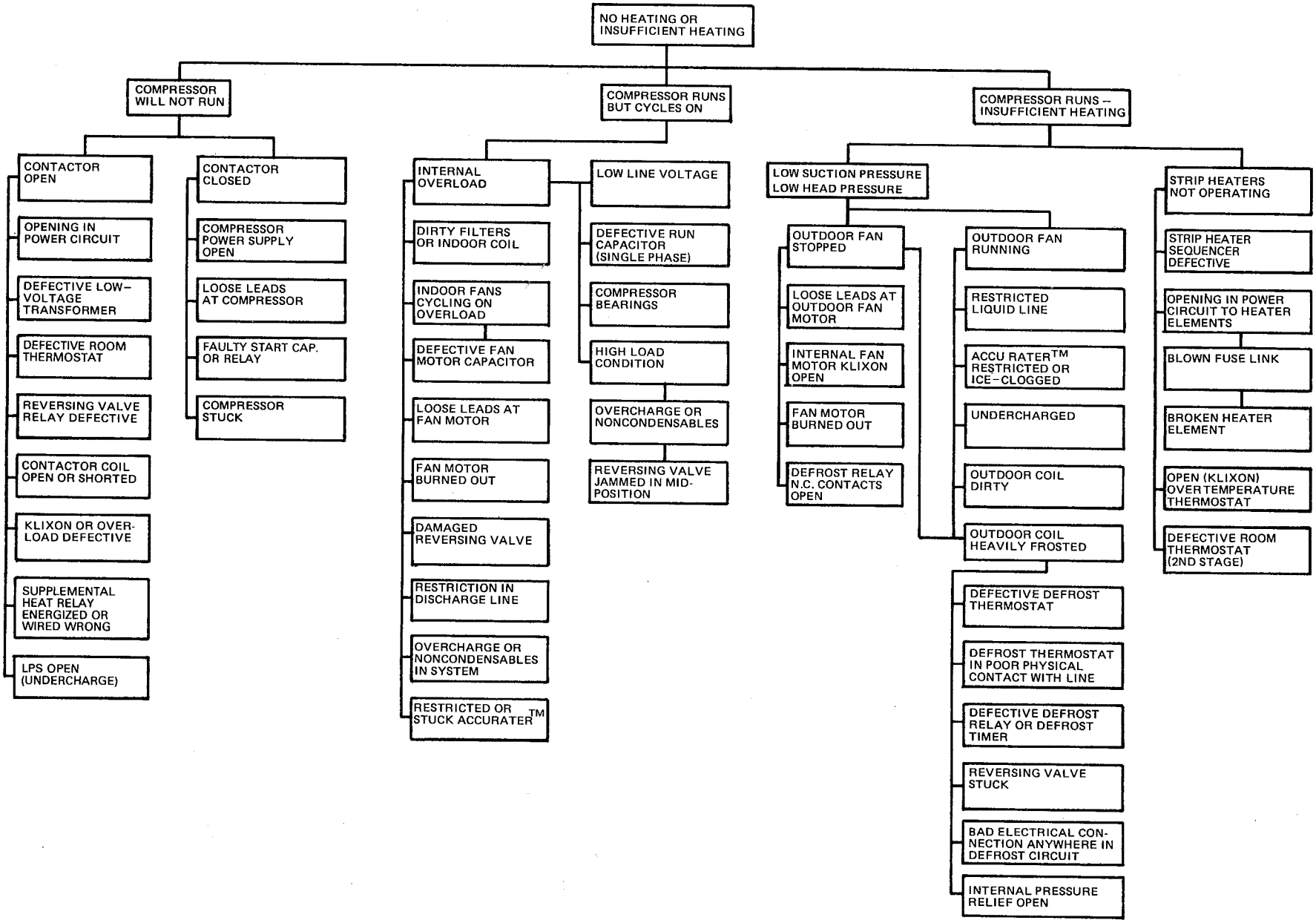
MODEL 50ET,QT	DIMENSION A (in.)
212,215	2½
218,224,230	2

Fig. 19 — Outdoor Fan Position

TROUBLESHOOTING CHART — COOLING CYCLE



TROUBLESHOOTING CHART — HEATING CYCLE


NO HEATING OR INSUFFICIENT HEATING
COMPRESSOR WILL NOT RUN
CONTACTOR OPEN
OPENING IN POWER CIRCUIT
DEFECTIVE LOW-VOLTAGE TRANSFORMER
DEFECTIVE ROOM THERMOSTAT
REVERSING VALVE RELAY DEFECTIVE
CONTACTOR COIL OPEN OR SHORTED
KLIXON OR OVER-LOAD DEFECTIVE
SUPPLEMENTAL HEAT RELAY ENERGIZED OR WIRED WRONG
LPS OPEN (UNDERCHARGE)
CONTACTOR CLOSED
COMPRESSOR POWER SUPPLY OPEN
LOOSE LEADS AT COMPRESSOR
FAULTY START CAP. OR RELAY
COMPRESSOR STUCK
COMPRESSOR RUNS BUT CYCLES ON
INTERNAL OVERLOAD
DIRTY FILTERS OR INDOOR COIL
INDOOR FANS CYCLING ON OVERLOAD
DEFECTIVE FAN MOTOR CAPACITOR
LOOSE LEADS AT FAN MOTOR
FAN MOTOR BURNED OUT
DAMAGED REVERSING VALVE
RESTRICTION IN DISCHARGE LINE
OVERCHARGE OR NONCONDENSABLES IN SYSTEM
RESTRICTED OR STUCK ACCURATER™
LOW LINE VOLTAGE
DEFECTIVE RUN CAPACITOR (SINGLE PHASE)
COMPRESSOR BEARINGS
HIGH LOAD CONDITION
OVERCHARGE OR NONCONDENSABLES
REVERSING VALVE JAMMED IN MID-POSITION
COMPRESSOR RUNS – INSUFFICIENT HEATING
LOW SUCTION PRESSURE LOW HEAD PRESSURE
OUTDOOR FAN STOPPED
LOOSE LEADS AT OUTDOOR FAN MOTOR
INTERNAL FAN MOTOR KLIXON OPEN
FAN MOTOR BURNED OUT
DEFROST RELAY N.C. CONTACTS OPEN
OUTDOOR FAN RUNNING
RESTRICTED LIQUID LINE
ACCU RATER™ RESTRICTED OR ICE-CLOGGED
UNDERCHARGED
OUTDOOR COIL DIRTY
OUTDOOR COIL HEAVILY FROSTED
DEFECTIVE DEFROST THERMOSTAT
DEFROST THERMOSTAT IN POOR PHYSICAL CONTACT WITH LINE
DEFECTIVE DEFROST RELAY OR DEFROST TIMER
REVERSING VALVE STUCK
BAD ELECTRICAL CONNECTION ANYWHERE IN DEFROST CIRCUIT
INTERNAL PRESSURE RELIEF OPEN
STRIP HEATERS NOT OPERATING
STRIP HEATER SEQUENCER DEFECTIVE
OPENING IN POWER CIRCUIT TO HEATER ELEMENTS
BLOWN FUSE LINK
BROKEN HEATER ELEMENT
OPEN (KLIXON) OVER TEMPERATURE THERMOSTAT
DEFECTIVE ROOM THERMOSTAT (2ND STAGE)

Book 1 | 1 | 4 | 4
Tab 1b | 5a | 1a | 5a

PC 101 Catalog No. 535-078 Printed in U.S.A. Form 50ET,QT-7SI Pg 14 8-86 Replaces: 50ET,QT-3SI

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